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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/579,345 05/25/00 GILTON

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EXAMINER

RAO, S

ART UNIT

PAPER NUMBER

2814

DATE MAILED:

10/10/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/579,345

Applicant(s)

GILTON ET AL.

Examiner

Steven H. Rao

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 July 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 14, 15, 20-25, 31 and 37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 14, 15, 20-25, 31 and 37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

R s p o n s t o A m e n d m n t

Applicants' amendment filed July 17, 2001 has been entered on July 24, 2001.

Therefore claims 14-15, 202-5, 31 and 37 are currently pending in the application.

Double Patenting

The previous double patenting rejection is maintained for the reasons set out in the office action mailed May 9, 2001 and the reasons set out herein.

Applicants' and their Attorney apparently argue that claim 1 of Hawthorne does not teach or suggest the use of water.

The Examiner in the previous rejection cited Hawthorne claim 1 lines 9-10 which states, " solvent vapor to solubilize the photo resist material, said solvent material being alcohol " and referred to Hawthorne's specification col. 4 lines 60-67 as showing the solvent vapor as including a hydrous material such as water and an etching agent such as isopropyl alcohol.

It is well settled law that claims have to be interpreted in view of its specification and references to the specification can be made to demonstrate what is included in the claims.

Further water is the oldest well-known solvent and also a known solvent for isopropyl alcohol therefore it would have been obvious to use water as a solvent.

Therefore the Examiner is correct in citing the specification to further describe the claim (which must be read in light of the specification) upon which the double patenting rejection is based.

“those portions of the specification which provide support for the patent claims may also be examined and considered when addressing the issue of whether a claim in the application defines an obvious variation of an invention claimed in the patent .” (emphasis supplied). In re Vogel 422 F.2d 438, 441-442, 164 USPQ 619,622 (CCPA 1970).

Further The Examiner is also correct in pointing out what is the prior art and well known either by simply stating so or providing a reference to show what is well known in the art and how it would be obvious to modify applicants' present claims in view of the what is well known in the art.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 14-15,20-23, 25 and31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hawthorne (U.S. Patent No. 5,785,875, herein after Hawthorne) also previously applied for reasons set out in the office action mailed May 09, 2001 and those set out below.

With respect to claim 14, Applicants' claim Hawthorne does not teach or suggest the following :

1) Vaporizing a liquid solvent that is inert to a material on the surface of a wafer.

Hawthorne in col. 4 line 5-13 describes, “ The present invention is based upon the discovery by the inventor that while a liquid or vaporous solvent such as isopropyl

Art Unit: 2814

alcohol does not substantially strip photo resist material from an in-process integrated circuit wafer surface once the solvent is heated and vaporized, particularly in the case of isopropyl alcohol, it does effectively and efficiently solubilize and strip the photo resist material from the silicon substrate surface." (emphasis supplied).

2) selecting a reactant gas that is capable of chemically reacting with the material on the surface of the wafer (See above the selected gas isopropyl alcohol that reacts with the surface having photo resist and strips it (photo resist).

3) or incorporating the reactant gas into the vaporized liquid solvent .

Hawthorne in col. 4 lines 60- col. 5 line 1 describes, " Under the present inventive method, an interior 16 of the reaction chamber 10 is first filled with a hydrous material, such as water, from a fluid source 21, through valve and into bottom chamber opening 18 of chamber 10. In this manner, wafers 12 are fully submerged and isolated from the ambient atmosphere. Generally, an etching agent is injected, such as through a fluid source 21, into the hydrous material within the chamber 10 until the etching agent and hydrous material come to a desired relative concentration. And in col. 5 lines 11-14, " Thus, the next step in the method of the present invention is shown in Fig. 2 and comprises exposing wafers 12 to heated solvent vapor within reaction chamber 10." (emphasis supplied).

4) or condensing the vaporized solvent incorporating the reactant gas to form a film on the surface of the wafer so that the reactant gas is transported through the film to the material on the surface of the wafer.

Hawthorne in col. 3 lines 5 lines 1-5 states, " The etching agent and hydrous material are exposed to wafers 12 for a predetermined amount of time to suitable etch through openings 30 into film 26."

As stated earlier the Hawthorne does not specifically mention condensing but it is inherent when the heated vapor (between 50 – 200 degrees centigrade) comes in contact with the wafer which is at a lower temperature than the vaporized liquid, it (vaporized liquid) will condense.

The vaporized solvent incorporating the reactant gas is transported through the film to the material on the surface of the wafer in figure 3 openings 30 are formed in photo resist material 28 to allow film 26 to be etched in a subsequent etching step. (Hawthorne col. 4 lines 47-50).

Therefore the reactant gas has to etch film 26 and in order to do so has to be transported through the film to the material on the surface of the wafer.

With respect to claim 15 it was said to be allowable because it directly depends on claim 14.

However as shown above claim 14 is not allowable therefore claim 15 is also not allowable.

Claim 20 was said to be allowable because the prior art does not teach, " flowing a wafer cleaning gas over the liquid layer such that some of the flowing gas is transported through the liquid to the surface of the wafer.

Hawthorne in col. 5 lines 29-35 describes, " ...In flowing the heated solvent vapor through reaction chamber 10, a thin layer of liquid solvent typically forms above the

Art Unit: 2814

hydrous material and etching agent . This tends to help rinse the portions of film 26 etched by the etching agent from the surface of wafer 12. “ (emphasis supplied).

Therefore the heated solvent vapor has to flow through the thin layer of liquid solvent to the surface of the wafer to rinse the desired portions.

Claims 21-25 were said to be allowable because they depend upon allowable claim 20,

However as shown above claim 20 is not allowable therefore claims 21-25 are also not allowable.

Claim 21 is said to recite that the liquid is a solvent for cleaning gas. (see above under claim 20, Hawthorne col. 5 lines 29-35).

With respect to claim 25, Hawthorne describes isopropyl alcohol before heating which is inert and heated isopropyl alcohol which is an etch ant (Hawthorne col. 4 line 5-11).

Claim 31 was said to be allowable for the same reasons as claim 14, however as shown above claim 14 is not allowable therefore claim 31 is also not allowable.

With respect to claim 24, it is argued that limuro does not teach the formation of a liquid layer on the wafer surface . However limuro describes supplying heated water to the cooler surface of the wafer and it is inherent condensation will occur to form a water film on the wafer.

Further the rejection is based on the combined teachings of Hawthorne and limuro and as shown above shows the formation of liquid films(layers) on wafer.

Art Unit: 2814

Applicants' contend that Hawthorne was designed to avoid the disadvantages of prior art ashing methods it teaches away from using ashing methods.

This is incorrect because every patent by definition is an improvement over prior art i.e. they reduce or eliminate some of the disadvantages of the prior art.

Further nowhere in Hawthorne it is stated that Hawthorne's invention cannot be used with the Ashing process, but rather Hawthorne describes how a couple of the disadvantages of Hawthorne can be reduced by practicing the method described therein.

Therefore Hawthorne does not teach away from using the ashing methods.

Therefore claim 24 is not allowable over the prior art of record.

Claim 37 was said to be allowable for the same reasons as claim 24, however as shown above claim 24 is not allowable, therefore claim 37 is also not allowable.

Response to Arguments

Applicant's arguments filed 7/24/2001 have been fully considered but they are not persuasive for reasons given above.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action.

The same references as previously applied are used in this rejection therefore this also forms a separate basis for the Final rejection.

Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication should be directed to Steven H. Rao at telephone number 703-306-5945.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703- 306-2794. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703- 308-0956.

SN
10/05/01


Olik Chaudhuri
Supervisory Patent Examiner
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